

In re Application of:
David L. Franklin, et al.

Serial No. 10/734,468

AMENDMENTS TO THE CLAIMS

Please enter the following amendments to the claims:

1. (Currently amended) A portable circuit interrupting apparatus for use in association with a circuit isolating device comprising:

a main housing having a main housing body including a main housing body outer surface and a longitudinal axis;

a sleeve including a main sleeve body having a main sleeve body outer surface and coaxially mounted within the main housing so as to be slidable between an extended position and a retracted position, a spring assembly for biasing the main sleeve body from between the extended position toward the retracted position, and a reset plunger opening positioned in a medial portion of the main sleeve body;

a shunting circuit assembly having a ring engaging terminal adapted to electrically connect to a ring-like conducting part of a circuit isolating device and a hook engaging terminal adapted to electrically connect to a hook-like conducting part of a circuit isolating device, a shunting circuit segment connected between the ring engaging terminal and the hook engaging terminal and positioned within the housing and sleeve to interrupt an electrical connection between the ring-like conducting part and hook-like conducting part responsive to movement of the sleeve from the retracted position to the extended position;

a reset plunger assembly including a reset plunger and connected to a medial portion of the main housing body, adapted to extend at least portions of the reset plunger through the reset plunger opening in the medial portion of the main sleeve body when in a non-reset and biased inward lock position to releasably lock the sleeve in the extended position so as to obtain and maintain an electrical clearance between the ring engaging terminal and the hook engaging terminal when the ring engaging terminal and the hook engaging terminal engage a circuit isolating device and when the main sleeve body is positioned in the extended position, and adapted to reset outwardly responsive to outwardly biased pressure by a user and outward pressure from the main sleeve outer surface when the main sleeve body is in an at least partially retracted position; and

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an operation counter assembly positioned at the medial portion of the main housing body and including an operation counter connected to the reset plunger assembly and positioned to count a number of circuit interrupting operations of the circuit interrupting apparatus, responsive to movement of the reset plunger.

2. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 1, wherein the operation counter includes a rotational counter incrementor to increment a count of the operation counter, and wherein the operation counter assembly further includes a roll pin connected to the reset plunger and a click-over lever connected between the rotational counter incrementor and the roll pin and responsive to longitudinal movement of the reset plunger in a first direction to reset the counter to enable the operation counter to increment and responsive to longitudinal movement in a second direction to increment the operation counter when such movement occurs.

3. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 1, wherein the operation counter includes a counter incrementor switch to increment a count of the operation counter, and wherein the portable circuit interrupting apparatus further includes means for engaging the counter incrementor switch positioned to increment the operation counter responsive to movement of the reset plunger in a longitudinal direction.

4. (Currently amended) A portable circuit interrupting apparatus for use in association with a circuit isolating device comprising:

a main housing having a main housing body including a main housing body outer surface and a longitudinal axis;

a sleeve including a main sleeve body having a main sleeve body outer surface and coaxially mounted within the main housing so as to be slidable between an extended position and a retracted position, a spring assembly for biasing the main sleeve body from between the extended position toward the retracted position, and a reset plunger opening positioned in a medial portion of the main sleeve body;

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a shunting circuit assembly having a ring engaging terminal adapted to electrically connect to a ring-like conducting part of a circuit isolating device and a hook engaging terminal adapted to electrically connect to a hook-like conducting part of a circuit isolating device, a shunting circuit segment connected between the ring engaging terminal and the hook engaging terminal and positioned within the housing and sleeve to interrupt an electrical connection between the ring-like conducting part and hook-like conducting part responsive to movement of the sleeve from the retracted position to the extended position;

a reset plunger assembly including a reset plunger and connected to a medial portion of the main housing body, adapted to extend at least portions of the reset plunger through the reset plunger opening in the medial portion of the main sleeve body when in a non-reset and biased inward lock position to releasably lock the sleeve in the extended position so as to obtain and maintain an electrical clearance between the ring engaging terminal and the hook engaging terminal when the ring engaging terminal and the hook engaging terminal engage a circuit isolating device and when the main sleeve body is positioned in the extended position, and adapted to reset outwardly responsive to outwardly biased pressure by a user and outward pressure from the main sleeve outer surface when the main sleeve body is in an at least partially retracted position; and

an operation counter assembly including an operation counter connected to the reset plunger and positioned to count a number of circuit interrupting operations of the circuit interrupting apparatus, responsive to movement of the reset plunger, and having:

a magnet positioned adjacent a portion of the reset plunger, and

a counter incrementor switch including a magnetic switch positioned to increment a count of the operation counter responsive to positioning of the magnet adjacent the magnetic switch resulting from longitudinal movement of the reset plunger.

5. (Previously presented) A portable circuit interrupting apparatus for use in association with a circuit isolating device comprising:

a main housing having a main housing body including a main housing body outer surface and a longitudinal axis;

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a sleeve including a main sleeve body having a main sleeve body outer surface and coaxially mounted within the main housing so as to be slidable between an extended position and a retracted position, a spring assembly for biasing the main sleeve body from between the extended position toward the retracted position, and a reset plunger opening positioned in a medial portion of the main sleeve body;

a shunting circuit assembly having a ring engaging terminal adapted to electrically connect to a ring-like conducting part of a circuit isolating device and a hook engaging terminal adapted to electrically connect to a hook-like conducting part of a circuit isolating device, a shunting circuit segment connected between the ring engaging terminal and the hook engaging terminal and positioned within the housing and sleeve to interrupt an electrical connection between the ring-like conducting part and hook-like conducting part responsive to movement of the sleeve from the retracted position to the extended position;

a reset plunger assembly including a reset plunger and connected to a medial portion of the main housing body, adapted to extend at least portions of the reset plunger through the reset plunger opening in the medial portion of the main sleeve body when in a non-reset and biased inward lock position to releasably lock the sleeve in the extended position so as to obtain and maintain an electrical clearance between the ring engaging terminal and the hook engaging terminal when the ring engaging terminal and the hook engaging terminal engage a circuit isolating device and when the main sleeve body is positioned in the extended position, and adapted to reset outwardly responsive to outwardly biased pressure by a user and outward pressure from the main sleeve outer surface when the main sleeve body is in an at least partially retracted position;

an operation counter assembly including an operation counter connected to the reset plunger, positioned to count a number of circuit interrupting operations of the circuit interrupting apparatus, responsive to movement of the reset plunger, and positioned to record a number of counts associated with a categorical type of usage of the circuit interrupting apparatus, and having:

a counter incrementor switch to increment a count of the operation counter,
responsive to movement of the reset plunger in a longitudinal direction,
means for engaging the counter incrementor switch, and

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a magnetic flux determiner for measuring the strength of the magnetic flux to determine the categorical type of usage of the circuit interrupting apparatus.

6. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 3, wherein the operation counter assembly further includes a selection switch for selecting a plurality of categories of amperage range of values most closely associated with the circuit isolating device, and wherein the operation counter separately records the count and associates the count with a category selected from the plurality of categories and tracks a number of counts associated with each of the plurality of categories and displays the number of counts associated with the category so selected.

7. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 1, wherein the main housing body includes a main housing body opening, and wherein the reset plunger assembly further includes a reset plunger extension connected within and extending out from the main housing body opening and having a reset plunger conduit, and a spring to bias the reset plunger in an inwardly direction so that the reset plunger engages the reset plunger opening when the main sleeve body is extended and the reset plunger opening is adjacent the reset plunger.

8. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 7, wherein the operation counter assembly further includes an operation counter housing having an operation counter housing front, an operation counter housing back, and at least one operation counter housing side positioned therebetween and containing the operation counter therein, the operation counter housing back having an operation counter housing back opening positioned in a surrounding relationship around outer surface peripheries of the reset plunger extension to prevent contamination of the operation counter from contaminants external to the operation counter housing, the operation counter housing front having an operation counter housing front opening positioned in a surrounding relationship around outer surface peripheries of the reset plunger extending therethrough.

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9. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 1, wherein the operation counter is non-resettable by a field operator in order to prevent inadvertent reset of the operation count.

10. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 1, wherein the operation counter assembly includes a fastener to fasten the operation counter housing to the medial portion of the main housing body of the circuit interrupting apparatus.

11. (Currently amended) An operation counter assembly ~~adapted to be positioned on a circuit interrupting apparatus for use in association with a circuit isolating device, the circuit interrupting apparatus having a main housing including a main housing body having a main housing body outer surface and a sleeve including a main sleeve body having a main sleeve body outer surface and coaxially mounted within the main housing, the operation counter assembly comprising:~~

a reset plunger assembly including a reset plunger adapted to extend through a portion of the main housing body outer surface of the circuit interrupting device, at least portions of the reset plunger adapted to extend through a reset plunger opening in a medial portion of the main sleeve body when in a non-reset and biased inward lock position to releasably lock the main sleeve body in an extended position so as to obtain and maintain an electrical clearance between a ring engaging terminal and a hook engaging terminal of the circuit interrupting device when the ring engaging terminal and the hook engaging terminal engage the circuit isolating device and when the main sleeve body is positioned in the extended position, and adapted to reset outwardly responsive to outwardly biased pressure by a user and outward pressure from the main sleeve outer surface when main sleeve body is in an at least partially retracted position; and

an operation counter positioned at a medial portion of the main housing body and connected to or adjacent the reset plunger assembly and positioned to count and display a number of circuit interrupting operations of the circuit interrupting apparatus, responsive to movement of the reset plunger.

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12. (Previously presented) The operation counter assembly as defined in Claim 11, wherein the operation counter includes a rotational counter incrementor to increment a count of the operation counter, and wherein the operation counter assembly further includes a roll pin adapted to be connected to the reset plunger and a click-over lever connected between the rotational counter incrementor and the roll pin and responsive to longitudinal movement of the reset plunger in a first direction to reset the counter to enable the operation counter to increment and responsive to longitudinal movement in a second direction to increment the operation counter when such movement occurs.

13. (Previously presented) The operation counter assembly as defined in Claim 11, wherein the operation counter includes a counter incrementor switch to increment a count of the operation counter, and wherein the operation counter assembly further includes means for engaging the counter incrementor switch positioned to increment the operation counter responsive to movement of the reset plunger in a longitudinal direction.

14. (Previously presented) The operation counter assembly as defined in Claim 13, wherein the means for engaging the counter incrementor switch includes a magnet positioned adjacent a portion of the reset plunger, and wherein the counter incrementor switch includes a magnetic switch responsive to positioning of the magnet adjacent the magnetic switch resulting from longitudinal movement of the reset plunger.

15. (Previously presented) The operation counter assembly as defined in Claim 13, wherein the operation counter assembly includes a magnetic flux determiner for measuring the strength of the magnetic flux to determine a categorical type of usage of the circuit interrupting apparatus, and wherein the operation counter separately records a number of counts associated with each of the categorical type of usages.

16. (Previously presented) The operation counter assembly as defined in Claim 13, wherein the operation counter assembly includes a selection switch for selecting a plurality of categories of

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amperage range of values most closely associated with the circuit isolating device, and wherein the operation counter separately records the count and associates the count with a category selected from the plurality of categories and tracks a number of counts associated with each of the plurality of categories and displays the number of counts associated with the category so selected.

17. (Previously presented) The operation counter assembly as defined in Claim 11, wherein the main housing body of the circuit interrupting apparatus includes a main housing body opening, and wherein the reset plunger assembly further includes a reset plunger extension adapted to extend out from the main housing body opening and having a reset plunger conduit and a spring to bias the reset plunger in an inwardly direction so that the reset plunger engages the reset plunger opening when the main sleeve body is extended and the reset plunger opening is adjacent the reset plunger.

18. (Previously presented) The operation counter assembly as defined in Claim 17, further comprising an operation counter housing having an operation counter housing front, an operation counter housing back, and at least one operation counter housing side positioned therebetween and containing the operation counter therein, the operation counter housing back having an operation counter housing back opening positioned in a surrounding relationship around outer surface peripheries of the reset plunger extension to prevent contamination of the operation counter from contaminants external to the operation counter housing, the operation counter housing front having an operation counter housing front opening positioned in a surrounding relationship around outer surface peripheries of the reset plunger extending therethrough.

19. (Previously presented) The operation counter assembly as defined in Claim 11, wherein the operation counter is non-resettable by a field operator in order to prevent inadvertent reset of the operation count.

20. (Previously presented) The operation counter assembly as defined in Claim 11, further comprising a fastener to fasten the operation counter housing to a medial portion of the main housing body of the circuit interrupting apparatus.

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21. (Currently amended) A method of forming a circuit interrupting apparatus adapted to count a number of circuit interrupting operations, the method comprising the steps of:

providing an operation counter to be positioned at a medial portion of a main housing body of the circuit interrupting apparatus and including an operation counter housing containing an operation counter and an operation counter actuating switch and having an operation counter housing back side opening adapted to interface with a reset plunger assembly including a reset plunger extending protruding through a main housing body outer surface of the main housing body of the circuit interrupting apparatus and an operation counter housing front side opening for allowing passage of the reset plunger through the operation counter housing;

connecting installing an operation counter actuating switch actuator to the reset plunger;
and

fastening the operation counter housing ~~to a~~ at the medial body portion of the main housing body of the circuit interrupting apparatus separate and spaced apart from an exhaust control assembly of the circuit interrupting apparatus.

22. (Currently amended) A method of using a circuit interrupting apparatus on a circuit isolating device, the method comprising the steps of:

positioning a reset plunger to extend through a reset plunger opening in a portion of a main sleeve body positioned within a medial portion of a main housing body of the circuit interrupting apparatus when the main sleeve body is positioned in an extended position;

engaging a hook-like conducting part of the circuit isolating device with a hook engaging terminal of the circuit interrupting apparatus adapted to electrically connect to the hook-like conducting part;

engaging a ring like conducting part of the circuit isolating device with a ring engaging terminal of the circuit interrupting apparatus adapted to electrically connect to the ring-like conducting part of the circuit isolating device, the ring like conducting part being relatively moveable between a contacting position to establish a closed circuit through the circuit isolating device and a separated position to establish an open circuit through the circuit isolating device and

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to extend the main sleeve body from within the main housing body of the circuit interrupting apparatus;

extending at least portions of the reset plunger through the reset plunger opening in the medial portion of the main sleeve body responsive to positioning of the main sleeve body in the extended position; and

incrementing an operation counter, ~~connected to~~ positioned at a medial portion of the main body housing of the circuit interrupting apparatus separate and spaced apart from an exhaust control assembly of the circuit interrupting apparatus, upon and directly in response to at least one of extension and retraction of the at least portions of the reset plunger through the medial portion of the main sleeve body.

23. (Currently amended) A portable circuit interrupting apparatus for use in association with a circuit isolating device comprising:

a main housing including a main housing body outer surface;

a sleeve including a main sleeve body having a main sleeve body outer surface and coaxially mounted within the main housing;

a reset plunger adapted to extend through a medial portion of the main housing body outer surface and into a reset plunger opening in a portion of the main sleeve body, when in a non-reset and biased inward lock position to releasably lock the main sleeve body in an extended position, and adapted to reset outwardly responsive to outward pressure from the main sleeve body outer surface when the main sleeve body is in an at least partially retracted position; and

an operation counter assembly associated with the reset plunger, positioned at the medial portion of the main housing body, and positioned, responsive to the movement of the reset plunger, to count a number of circuit interrupting operations of the circuit interrupting apparatus.

24. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 23, wherein the operation counter assembly is interfaced with the reset plunger, wherein the operation counter assembly includes an operation counter, and wherein the operation counter assembly includes a counter incrementor switch positioned to increment a count of the operation counter

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responsive to extension of at least portions of the reset plunger through an opening in the main sleeve body.

25. (Previously presented) The portable circuit interrupting apparatus as defined in Claim 23, wherein the main housing body includes a main housing body opening, and wherein the portable circuit interrupting apparatus further comprises:

a reset plunger assembly including a reset plunger extension connected within and extending out from the main housing body opening and having a reset plunger conduit, and a spring to bias the reset plunger in an inwardly direction so that the reset plunger engages the reset plunger opening when the main sleeve body is extended and the reset plunger opening is adjacent the reset plunger; and

an operation counter housing having an operation counter housing front, an operation counter housing back, and at least one operation counter housing side positioned therebetween and containing the operation counter therein, the operation counter housing back having an operation counter housing back opening positioned in a surrounding relationship around outer surface peripheries of the reset plunger extension to prevent contamination of the operation counter from contaminants external to the operation counter housing, the operation counter housing front having an operation counter housing front opening, the reset plunger extending therethrough.

26. (Currently Amended) An operation counter assembly ~~adapted to be positioned~~ on a circuit interrupting apparatus for use in association with a circuit isolating device, the circuit interrupting apparatus having a main housing including thea main housing body having a main housing body outer surface, a sleeve including a main sleeve body coaxially mounted within the main housing body, a reset plunger adapted to extend through the main housing body and into a preselected portion of the main sleeve body to releasably lock the main sleeve body in an extended position, and an exhaust control assembly positioned to release exhaust gases during circuit interruption, the operation counter assembly comprising:

an operation counter ~~adapted to be positioned connected to a medial~~ portion of the main housing body at least partially external to the main housing body outer surface, separate and spaced

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apart from the exhaust control assembly to avoid the exhaust gases, to thereby extend a service life of the operation counter, and adapted to be positioned to count a number of circuit interrupting operations of the circuit interrupting apparatus indicated by substantially full operational extension of the main sleeve body.

27. (Previously presented) The operation counter assembly as defined in Claim 26, wherein the operation counter is adapted to increment, responsive to longitudinal extension of at least portions of the reset plunger through an opening in the main sleeve body.

28. (Currently amended) An operation counter assembly ~~adapted to be positioned~~ on a circuit interrupting apparatus for use in association with a circuit isolating device, the circuit interrupting apparatus comprising a main housing including a main housing body having a main housing body outer surface and an exhaust control assembly connected to the main housing body and positioned to release exhaust gases during circuit interruption, the operation counter assembly comprising:

a plunger ~~adapted to~~ extending through a medial portion of the main housing body; and

an operation counter ~~adapted to be connected to~~ positioned at the medial portion of the main housing body substantially external to the main housing body outer surface, and separate and spaced apart from the exhaust control assembly to avoid the exhaust gases, to thereby extend a service life of the operation counter, and ~~adapted to be positioned~~ to count a number of circuit interrupting operations of the circuit interrupting apparatus, responsive to longitudinal movement of the plunger.

29. (Currently amended) An operation counter assembly ~~adapted to be positioned~~ on a circuit interrupting apparatus for use in association with a circuit isolating device, the circuit interrupting apparatus having a main housing including a main housing body, a sleeve including a main sleeve body coaxially positioned within the main housing body, a reset plunger positioned ~~adapted to~~ extend longitudinally through an opening in the main housing body and into a preselected portion of the main sleeve body to releasably lock the main sleeve body in an extended and locked position when performing a circuit-interrupting operation, and positioned ~~adapted to~~ reset outwardly

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responsive to outward pressure from the main sleeve outer surface when the main sleeve body is in an at least partially retracted position to allow the main sleeve body to be retracted and the circuit interrupting apparatus to be readied for a next circuit-interrupting operation, the operation counter assembly including an operation counter ~~connected to or~~ positioned at a medial portion of the main housing body, interfaced with the reset plunger, and positioned to count a number of circuit interrupting operations of the circuit interrupting apparatus, responsive to longitudinal movement of the reset plunger during a circuit-interrupting operation.

30. (Currently amended) The operation counter assembly as defined in Claim 29,

wherein the operation counter is adapted to increment, responsive to longitudinal extension of at least portions of the reset plunger through an opening in the main sleeve body; and

wherein the operation counter is adapted to reset for a next count, responsive to manual extraction of the reset plunger from the opening in the main ~~stage-sleeve~~ sleeve body by a user.